HLA Sequences, January 2002

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The HLA sequences included in this compilation are taken from publications listed in the WHO Nomenclature reports (1-8). Where discrepancies have arisen between reported sequences, the original authors have been contacted where possible, and necessary amendments to published sequences have been incorporated into this alignment. Future sequencing may identify errors in this list and we would welcome any evidence that helps to maintain the accuracy of this compilation.

In the sequence alignments, for each locus alleles have been aligned to a reference sequence and identity between residues is indicated by a hyphen (-). Unavailable sequence information is indicated by an asterisk (*). Minimum gaps in the sequence, indicated by a period (.), are inserted to maintain the alignment between alleles showing variation in length. The exon intron boundaries are indicated by a pipe (|). In the amino acid alignments premature stop codons are indicated by an X.

Numbering is given both for individual nucleotides and also for codons. The nucleotides are numbered starting at 1 for the first nucleotide of the codon for the initiation methionine. The numbering of the codons of the mature protein, after cleavage of the signal sequence begins at +1, while the signal sequence is numbered backwards from -1.

This series of sequence alignments updates those published previously (9-16) and those versions previously made available from this web site.

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IMGT/HLA Sequence Database Release 1.13.0 NEW!

The HLA Sequence Database

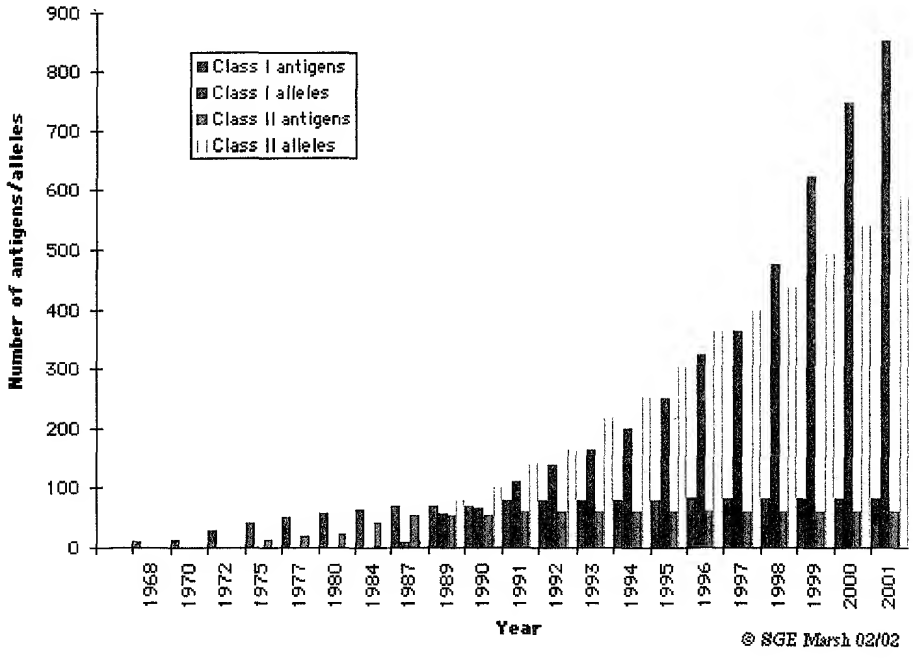
The HLA Sequence Database which holds information on HLA sequences currently contains 1496 allele sequences. In addition to the physical sequences the database contains detailed information concerning the material from which the sequence was derived and data on the validation of the sequences. To date (January 2001), some 239 HLA-A, 475 HLA-B, 114 HLA-C, 6 HLA-E, 1 HLA-F and 15 HLA-G class I alleles have been named. A total of 2 HLA-DRA, 376 HLA-DRB, 22 HLA-DQA1, 49 HLA-DQB1, 20 HLA-DPA1, 96 HLA-DPB1, 4 HLA-DMA, 6 HLA-DMB, 8 HLA-DOA and 8 HLA-DOB class II sequences have also been assigned. There are also 6 TAP1, 4 TAP2 and 54 MICA sequences. It is now established procedure for authors to submit the sequences directly to the HLA Sequence Database for checking and assignment of an official name before publication, this avoids the problems associated with renaming published sequences and the confusion of multiple names for the same sequence. The need for reasonably rapid publication of new HLA allele sequences has necessitated an annual meeting of the WHO Nomenclature Committee for Factors of the HLA System. Additionally we now publish monthly HLA nomenclature updates both in journals and on the World Wide Web (WWW) to provide quick and easy access to new sequence information. Links to the HLA sequences and nomenclature information are given above.

The IMGT/HLA Database

In collaboration with the Imperial Cancer Research Fund (ICRF) and European Bioinformatics Institute (EBI) we have developed an ORACLE database to house the HLA sequences in such a way as to allow users to present complex queries about the sequence, sequence features, references, contacts and allele designations to the database via a graphical user interface over the WWW. The initial development of this database was been funded by collaborative European Union BIOMED1 (BIOCT930038) and BIOTECH2 (BIO4CT960037) grants awarded to the ICRF as part of the International ImMunoGeneTics (IMGT) databases. The work on the HLA database is done in collaboration with Julia Bodmer (ICRF), James Robinson previously of the ICRF now at the ANRI and Peter Parham of Stanford University. Direct access to the IMGT/HLA Sequence Database is available from the link above.

In addition to the interactive access to HLA sequences alignments and other tools available via the IMGT/HLA database, we release a set of static alignments on this web site. These are updated every three months.

The Graph below indicates the numbers of antigens and alleles named since the HLA Nomenclature Committee was first formed in 1968, up to end December 2001.



IMPORTANT - Support for the HLA Sequence Database

The work of maintaining and updating the database has been supported in the past by the Imperial Cancer Research Fund, the National Institute of Health, the National Marrow Donor Program (NMDP) and more recently by the Anthony Nolan Bone Marrow Trust. Alternate sources of financial support have been sought for the continued maintenance of the database, and an initiative by Janet Hegland at the NMDP has been successful in soliciting funds from companies who produce HLA typing reagents, typing systems, and instrumentation or that otherwise utilize these databases in critical components of their business. So far contributions to this fund have been received from Applied Biosystems, Anthony Nolan Bone Marrow Trust, American Society for Histocompatibility and Immunogenetics (ASHI), Dynal, Forensic Analytical, GenoVision-Olerup SSP, Innogenetics,

Lifecodes Corporation, National Marrow Donor Program (NMDP), Pel-Freez Clinical Systems LLC, Visible Genetics and the German National Bone Marrow Donor Registry (ZKRD).

More information on this proposal can be obtained from the Sequence.Org Website. If you are using HLA typing kits or reagents which are supplied by companies who are not supporting this venture please encourage them to contribute, this will help to ensure the continued free access to the HLA Sequence Database, and enable its further development.

The HLA FactsBook - *Steven Marsh, Peter Parham, Linda Barber*

The HLA FactsBook presents up-to-date and comprehensive information on the HLA genes in a manner that is accessible to both beginner and expert alike. The focus of the book is on the polymorphic HLA genes (HLA-A, B, C, DP, DQ, and DR) that are typed for in clinical HLA laboratories. Each gene has a dedicated section in which individual entries describe the structure, functions, and population distribution of groups of related allotypes. Fourteen introductory chapters provide a beginners' guide to the basic structure, function, and genetics of the HLA genes, as well as to the nomenclature and methods used for HLA typing. Further information on the HLA FactsBook may be found on the Academic Press site.

Other Projects

The Anthony Nolan Trust maintains a database of over 300,000 potential bone marrow donors, each of whom have been typed for their HLA antigens or alleles. This provides an ideal source of information for establishing both the HLA allele and haplotype frequencies in the different ethnic populations represented in the panel. In collaboration with the routine HLA typing laboratory we are currently analysing data from British Askenazi Jewish and Afro-Caribbean populations. Such analysis will provide useful when searching for potential bone marrow donors.

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HLA Class I and II Sequence Alignments

January 2002 update

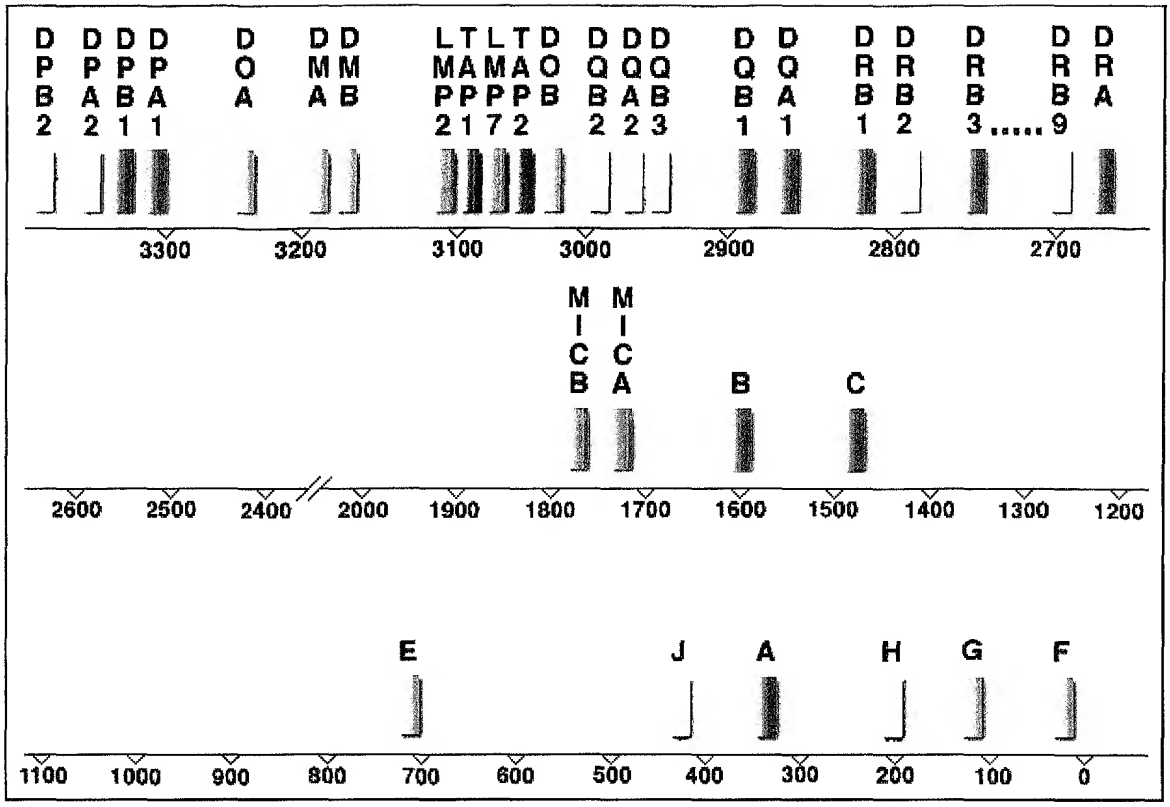
The alignments and files provided here are based on release 1.13.0 of the IMGT/HLA Sequence Database

- General Information on the HLA sequence alignments
- About this release
  Details of all changes since release 1.12.1
- Download
  A single zipped archive of all the text alignments is available from the IMGT/HLA ftp server. Save this.

Map of the HLA Region

To see sequences and reference information, use the map below to click on the gene whose data interest you...

If you have problems with the maps, try this.



Funding information